

Remarks

Claims 1, 3-5, and 7-13 are pending in the application, with claims 2 and 6 previously canceled. In the Office Action, claims 1, 10, and 11-13 are rejected under 35 U.S.C. §103(a) as allegedly obvious over US Patent No. 5,498,355 to Perozzi et al. ("Perozzi") in view of European Patent Publication No. EP 0434464 A1 to Waters et al. ("EP '464"). Claim 7 is rejected under 35 U.S.C. §103(a) as allegedly obvious over Perozzi in view of EP '464, and further in view of US Patent No. 6,133,207 to Milner et al. ("Milner"). Claims 8 and 9 are rejected under 35 U.S.C. §103(a) as allegedly obvious over Perozzi in view of EP '464, and further in view of European Patent Publication No. EP 0744456 A2 to Walters et al. ("EP '456"). Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as allegedly obvious over Perozzi in view of EP '464 and EP '456. Claim 5 is rejected under 35 U.S.C. 103(a) as allegedly obvious over Perozzi in view of EP '464 and US Patent No. 4,282,153 to Minn ("Minn"). All rejections are respectfully traversed in light of the amendment and remarks presented herein.

As a side note, it is stated in the Office Action that EP '464 is a newly cited reference; however, Applicants would like to point out that EP '464 a foreign counterpart of previously cited US Patent No. 5,254,272, both of which claim priority to GB 8929096.

In the present amendment, claims 1, 3, and 5 are amended to more particularly point out and distinctly define the claimed subject matter. The amendments are fully supported by the claims as originally filed and support can also be found throughout the specification, for example in originally filed claim 2. No new matter is entered by the present amendments.

A. Claims 1, 3-5, 7-8, and 10-13 are Patentably Distinct Over the Cited References

In the Office Action, independent claims 1, 3, and 5 are rejected as allegedly obvious over Perozzi in view of EP '464, EP '456, and Minn. However, for a claim to be obvious over a combination of references, it must be shown that the combined references provide each and every element and limitation of the rejected claim, plus it must be shown that it would have been

“obvious” for a person of ordinary skill in the art to combine the references in the suggested manner in order to arrive at the present claim.

Claims 1, 3, and 5 define a gear oil composition including, among other things, a base oil having a kinematic viscosity at 100°C of about 4 to about 32 cSt. The gear oil also includes a di-t-butyl polysulfide mixture, which is specified in claims 1 and 5 to be a mixture of di-t-butyl disulfide, di-t-butyl trisulfide, and di-t-butyl tetrasulfide, having a sulfur activity of greater than about 125mg in the Copper Corrosion Test. The gear oil also includes a dihydrocarbyl dithiophosphate ester, which claim 5 recites as the product of a mixture of dicyclopentadiene and dialkyldithiophosphoric acid. The final component of the gear oil is a dihydrocarbyl (mono)thiophosphate amine salt.

The particular claimed composition advantageously provides a dual purpose gear oil for both manual transmissions and final gear sets (page 2, lines 14-17). The composition also exhibits good thermal stability and clean gear performance, as well as being low in odor, and resulting in low wear in a high temperature axle and bearing test while also reducing the concentration of extreme pressure (“EP”) alkyl polysulfide additives required without sacrificing the performance capabilities of the gear oil (page 3, Summary points 1-5).

Perozzi is directed to a dispersant composition of two different succinic derivative dispersants combined in a particular weight ratio to provide high dispersancy performance, especially when used in combination with metal-containing detergents. Generally, Perozzi makes reference to the fact that broad classes of EP and anti-wear (“AW”) agents may be used in conjunction with the composition. Included in the broad “laundry list” disclosure of such EP and AW agents are dihydrocarbyl polysulfides and amine salts of phosphoric acid esters and their partial or total analogues (Column 16, Line 18 – Column 17, Line 24), which as one of skill in the art would know encompasses an uncountable number of possible compounds, far from a finite and limited number of predictable options. Even though many possible alternative agents are listed, no teaching or suggestion is given as to the selection of any particular compounds for any reason, or to use the claimed mixture of components in the claimed proportions for achieving the objectives of the present invention. It is also notable that Perozzi makes no distinction between an AW agent and an EP agent and lumps all such agents together under in a single

category, with no suggestion as to a particular mixture of agents that would be useful in achieving the objectives of the present invention.

Furthermore, Perozzi makes no reference to the activity of the polysulfide component. The Office Action alleges that Perozzi's disclosure of dinonyl trisulfide would intrinsically have a Copper Corrosion Test ("CCT") value of above 125mg because it is technically a polysulfide, and di-t-nonyl polysulfide is disclosed in the table on page 17 of the present application as having a CCT value of 731mg. This assumption is erroneous. As seen in the table, the di-t-butyl trisulfide has a very low CCT value of 4mg, while di-t-butyl pentasulfide has a CCT value of 466mg, and yet di-t-butyl polysulfide is reported as having a CCT value of 126mg. Therefore, no correlation can be drawn between di-t-butyl polysulfide activity and di-t-nonyl polysulfide activity based on the information in the present application and from what is commonly known in the art, and one of ordinary skill in the art would not infer from Perozzi that dinonyl trisulfide has a CCT value of greater than 125mg, as claimed. The table on page 17 shows that the CCT value is dependent upon the number of sulfur atoms in the polysulfide, with polysulfides containing at least four sulfur atoms having much greater activity than those containing two or three sulfur atoms. The table does not show a correlation in sulfur activity based on the number of carbon atoms present in the alkyl chain, as is alleged by the office action.

As an even further point regarding the activity of the polysulfide component, the present claims call for a mixture of di-t-butyl di-, tri-, and tetra-sulfides. The activity of such a mixture is dependent upon the relative proportions of the low and high activity components in the mixture. Perozzi is manifestly deficient in disclosing the claimed di-t-butyl polysulfide mixture, and fails even further in teaching that the mixture has a sulfur activity corresponding to the claimed CCT value of greater than 125mg, which one of skill in the art would use as a guide for the mixing of the claimed components to achieve the desired results during the practice of the invention.

In an attempt to remedy the deficiencies of Perozzi to provide all of the elements and limitations of the present claim, EP '464 is combined with Perozzi. EP '464 is directed to a lubricant composition including an antiwear or load-carrying additive containing sulfur and/or phosphorus, and a corrosion inhibitor in the form of an amino succinated ester. The composition of EP '464 is said to be suitable for use in all types of hydraulic fluid (page 2, lines 12-16).

Similarly to Perozzi, EP '464 also broadly discloses dihydrocarbyl mono- and di-thiophosphates and their amine salts (page 2, lines 47-53) and dialkylpolysulfides (page 3, lines 9-10) as AW and EP agents. However, Perozzi fails to teach, disclose, or suggest the particular claimed components in the claimed proportions, or make any distinction between an EP agent and an AW agent, as in the present application. The mere generalization by EP '464 that compatible mixtures of such anti-wear or load-carrying agents could also be used (page 3, line 33) is not sufficient to provide a teaching, disclosure, or suggestion that the presently claimed selection of components would be desirable in a gear oil. Furthermore, EP '464 makes no reference to the sulfur activity of the polysulfide component, nor that the polysulfides have a CCT value of greater than 125mg, as called for in the present claims. Accordingly, the present claim is not obvious over Perozzi in view of EP '464.

In an attempt to remedy the deficiencies of Perozzi and EP '464 to provide all of the elements and limitations of the present claim, EP '456 is cited. EP '456 is directed to a lubricant composition including an oil-soluble sulfur-containing antiwear and/or extreme pressure agent of low activity, described as 65mg or less on a copper corrosion test (page 4, lines 29-34). EP '456 especially prefers sulfurized olefins of low activity (page 4, lines 43-47). Accordingly, EP '456 does not teach, disclose, or suggest the presently claimed polysulfide having a CCT value of greater than 125mg. Therefore the combination of Perozzi, EP '464, and EP '456 fails to render the present claim obvious.

In a further attempt to remedy the deficiencies of Perozzi, EP '464, and EP '456 to provide all of the elements and limitations of the present claim, Minn is added to the combination. Minn is directed to an insecticidal composition. Minn fails to make any teaching, disclosure, or suggestion as to the claimed components in the claimed proportions. Just as with the other three references discussed above, Minn is also manifestly deficient in teaching, disclosing, or suggesting the claimed polysulfide having the claimed CCT value of above 125mg.

Since none of the references teaches, discloses, or suggests the claimed polysulfide having the claimed CCT value of above 125mg, and at least one of the references (EP '456) teaches that the polysulfide should be of low activity (i.e. below 65mg), the present claims are not obvious over the combination of references because the combined references taken in their

entirety do not provide all of the elements and limitations of the present claims, and in fact lead away from the present claims. Reconsideration and allowance of amended independent claims 1, 3, and 5 are hereby respectfully requested.

Claims 7-8 and 10-13 depend from claim 1, and are also patentable over the combined references for at least the same reasons that claim 1 is patentable. According to the MPEP, if an independent claim is held to be allowable, then all claims dependent therefrom must also be allowable. In the Office Action, however, claim 7 was further rejected over the previously discussed combined references, and further in view of Milner. However, Milner also lacks the same element of dependent claim 1 that the other references also lack, i.e., a di-t-butyl polysulfide mixture having a CCT value of great than about 125 mg. Accordingly, claim 1 (and therefore claim 7) is patentably distinct over the entire combination of cited references. Reconsideration and allowance of claims 1, 3-5, 7-8, and 10-13 is hereby respectfully requested.

Conclusion

Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now fully in condition for allowance. Action in accordance therewith is respectfully requested.

Please debit a fee of \$120 from Deposit Account No. 12-2355 for a one-month extension of time for a response filed pursuant to 37 C.F.R. 1.17(a)(1). It is the belief of the undersigned that there are no other fees associated with this filing. However, in the event that the calculations are incorrect, the Commissioner is authorized to charge any deficiencies in fees or credit any overpayment associated with this communication to Deposit Account No. 12-2355.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Edward C. LaRose", with a long, sweeping horizontal stroke at the end.

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